# PHOTOFACT® Technical Service Data

SET 3889

MODEL CS-20201 (CHASSIS XL2)

MITSUBISHI

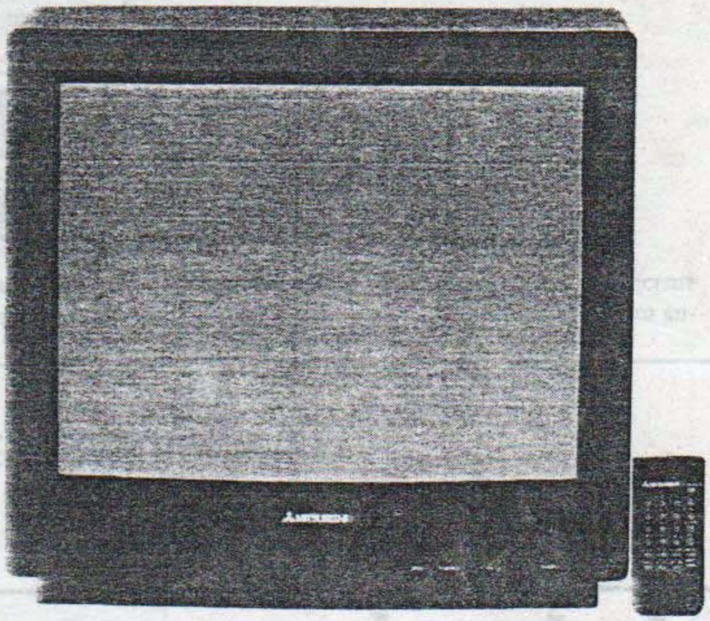
INDEX



For Supplier Address,
See PHOTOFACT Annual Index

## MITSUBISHI

**Model CS-20201 (Chassis XL2)**



*Representative Model*

Essential coverage
for servicing a television receiver...

- Schematics
- Component locations
- Parts list

3889


HOWARD W. SAMS & COMPANY

OCTOBER 1997 SET 3889

# SAFETY PRECAUTIONS

## SERVICE WARNING

Only qualified service technicians who are familiar with safety checks and guidelines should perform service work. Before replacing parts, disconnect power source to protect electrostatically sensitive parts. Do not attempt to modify any circuit unless so recommended by the manufacturer. When servicing the receiver, use an isolation transformer between the line cord and power receptacle.

## SERVICING THE HIGH VOLTAGE AND CRT

Use EXTREME CAUTION when servicing the high voltage circuits. To discharge static high voltage, connect a 10K ohms resistor in series with a test lead between the receiver and CRT anode lead. DO NOT lift the CRT by the neck. Always wear shatterproof goggles when handling the CRT to protect eyes in case of implosion.

## X-RAY RADIATION AND HIGH VOLTAGE LIMITS

Be aware of the instructions and procedures covering X-ray radiation. In solid-state receivers and monitors, the CRT is the only potential source of X-rays. Keep an accurate high voltage meter available at all times. Check meter calibration periodically. Whenever servicing a receiver, check the high voltage at various brightness levels to be sure it is regulating properly. Keep high voltage at rated value, NO HIGHER. Excessive high voltage may cause X-ray radiation or failure of associated components. DO NOT depend on protection circuits to keep voltage at rated value. When troubleshooting a receiver with excessive high voltage, avoid close contact with the CRT. DO NOT operate the receiver longer than necessary. To locate the cause of excessive high voltage, use a variable AC transformer to regulate voltage. In present receivers, many electrical and mechanical components have safety related characteristics which are not detectable by visual inspection. Such components are identified by a # on both the schematic and the parts list. For SAFETY, use only equivalent replacement parts when replacing these components.

## GENERAL GUIDELINES

Perform a final SAFETY CHECK before returning receiver to customer. Check repaired area for poorly soldered connections, and check entire circuit board for solder splashes. Check inner board wiring for pinched wires or wires contacting any high wattage resistors. Check that all knobs, shields, covers, grounds, and mounting hardware have been replaced. Be sure to replace all insulators and restore proper lead dress.

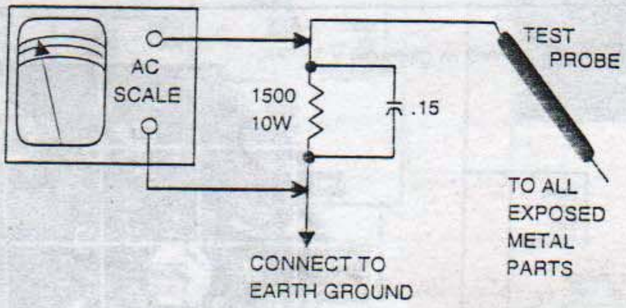
## SAFETY CHECKS – FIRE AND SHOCK HAZARD

### Cold Leakage Checks for Receivers with Isolated Ground

Unplug the AC cord, connect a jumper across the plug prongs, and turn the power switch on (if applicable). Use an ohmmeter to measure the resistance between the jumped AC plug and any exposed metal cabinet parts such as antenna screw heads, control shafts, or handle brackets. Exposed metal parts with a return path should measure between 1M ohms and 5.2M ohms. Parts without a return path must measure infinity.

### Hot Leakage Current Check

Plug the AC cord directly into an AC outlet. DO NOT use an isolation transformer. Use a 1500 ohms, 10W resistor in parallel with a .15µF capacitor to connect between any exposed metal parts on the receiver and a good earth ground. (See figure below.) Use an AC voltmeter with at least 5000 ohms per volt sensitivity to measure the voltage across the resistor. Check all exposed metal parts and measure voltage at each point. Voltage measurements should not exceed .75VAC, 500uA. Any value exceeding this limit constitutes a potential shock hazard and must be corrected. If the AC plug is not polarized, reverse the AC plug and repeat exposed metal part voltage measurement at each point.




### TEST JIG HOOKUP

| Function | Chek-A-Color Adapter No. | PC Board Plug No. | Pin | Color |
|---|---|---|---|---|
| CRT | B239 | DY-H | Red | Blue |
| Yoke | D482 | DY-H | Blue | Red |
| Yoke Setting | YP2A | DY-V | Yel | Yellow |
| Comments | Focus Tap | DY-V | Brown | Black |

### HIGH VOLTAGE SHUTDOWN TEST

After servicing the high voltage circuits, test the shutdown circuit by momentarily placing a 5000 ohms resistor between pins 1 and 5 of TP-33. The receiver should go into shutdown losing sound and raster. To return to normal operation, disconnect AC line cord for at least 5 seconds.



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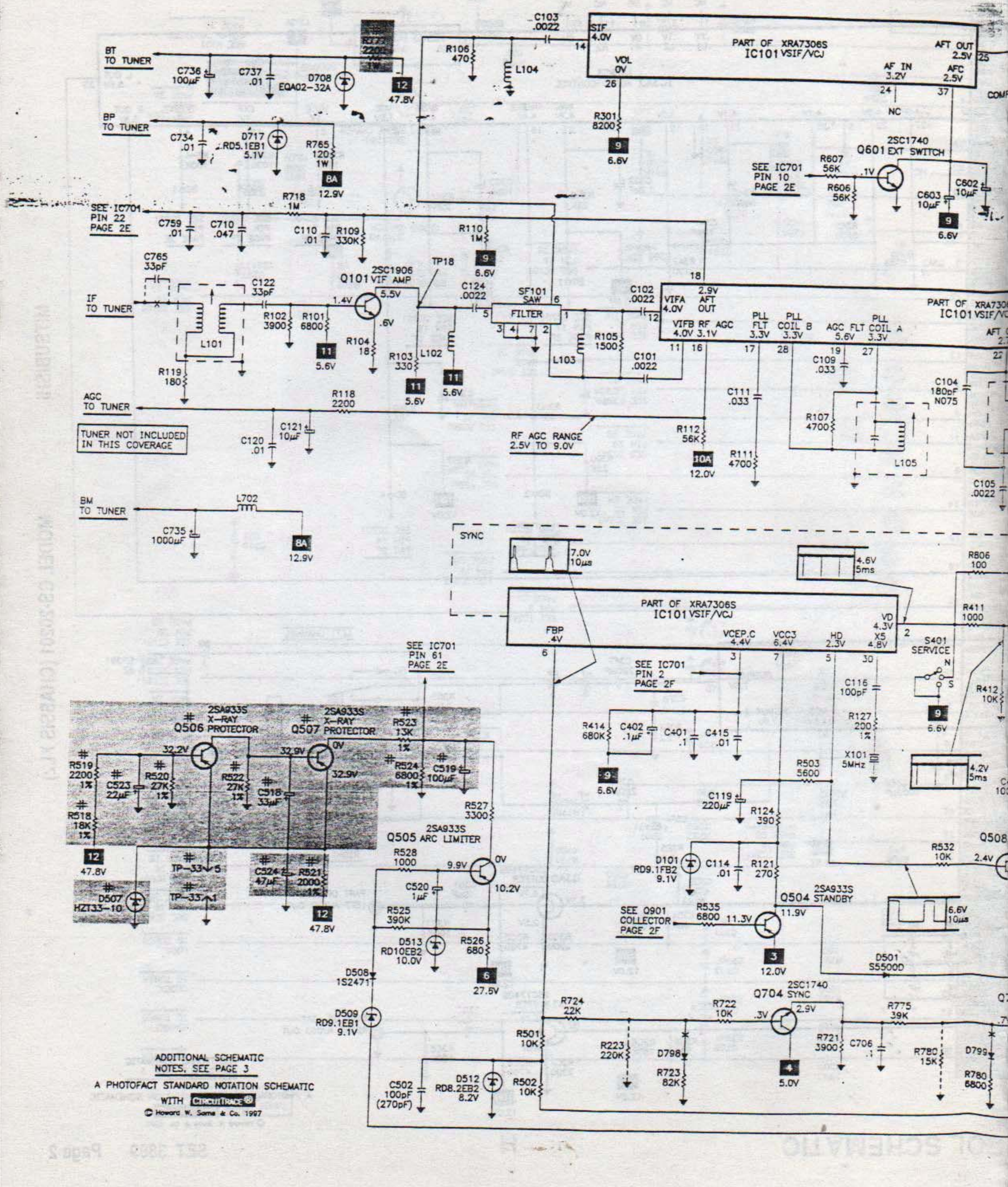
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0 81262 03889 5

3889

A

# TELEVISION

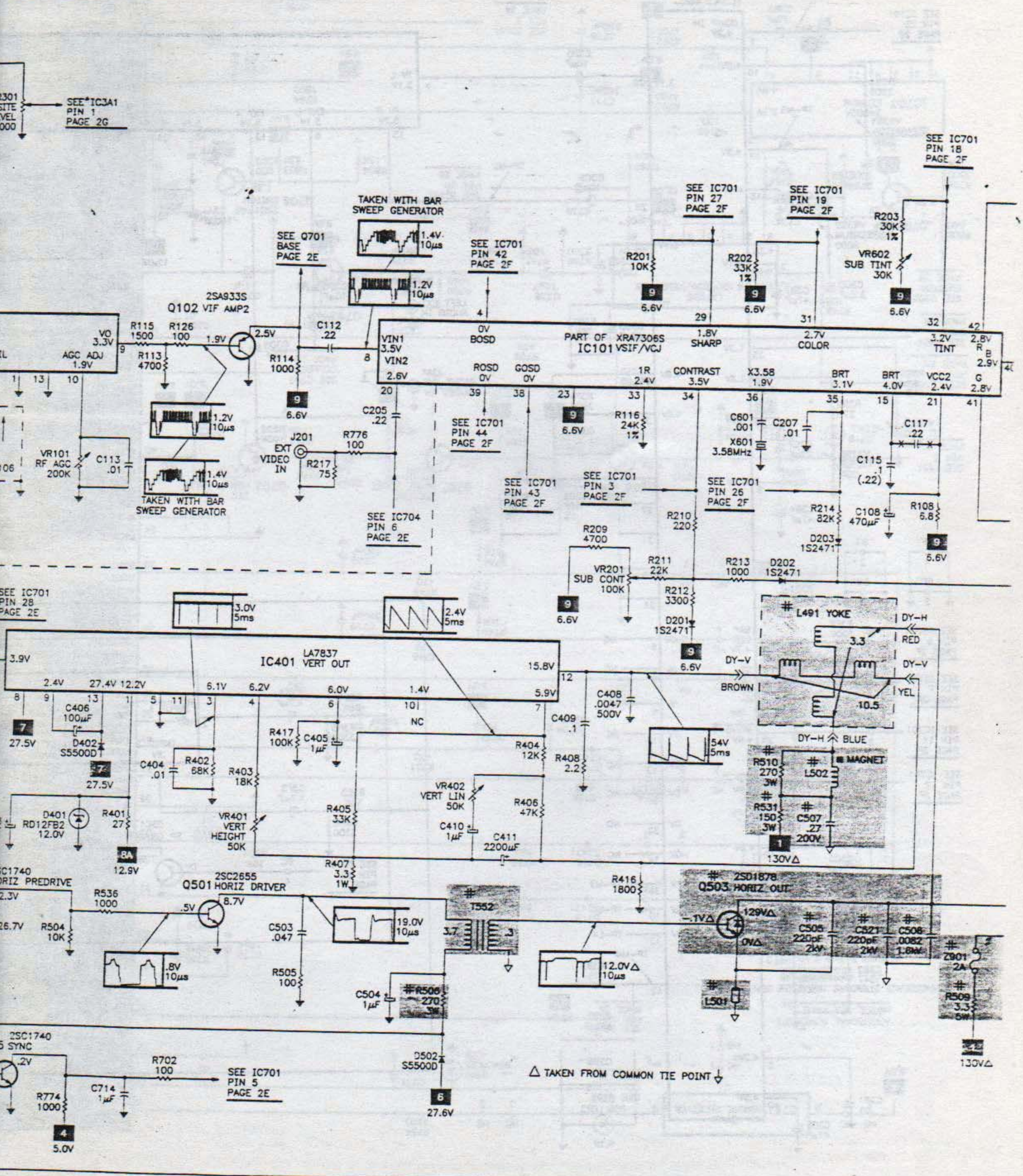



ADDITIONAL SCHEMATIC NOTES, SEE PAGE 3

A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE®

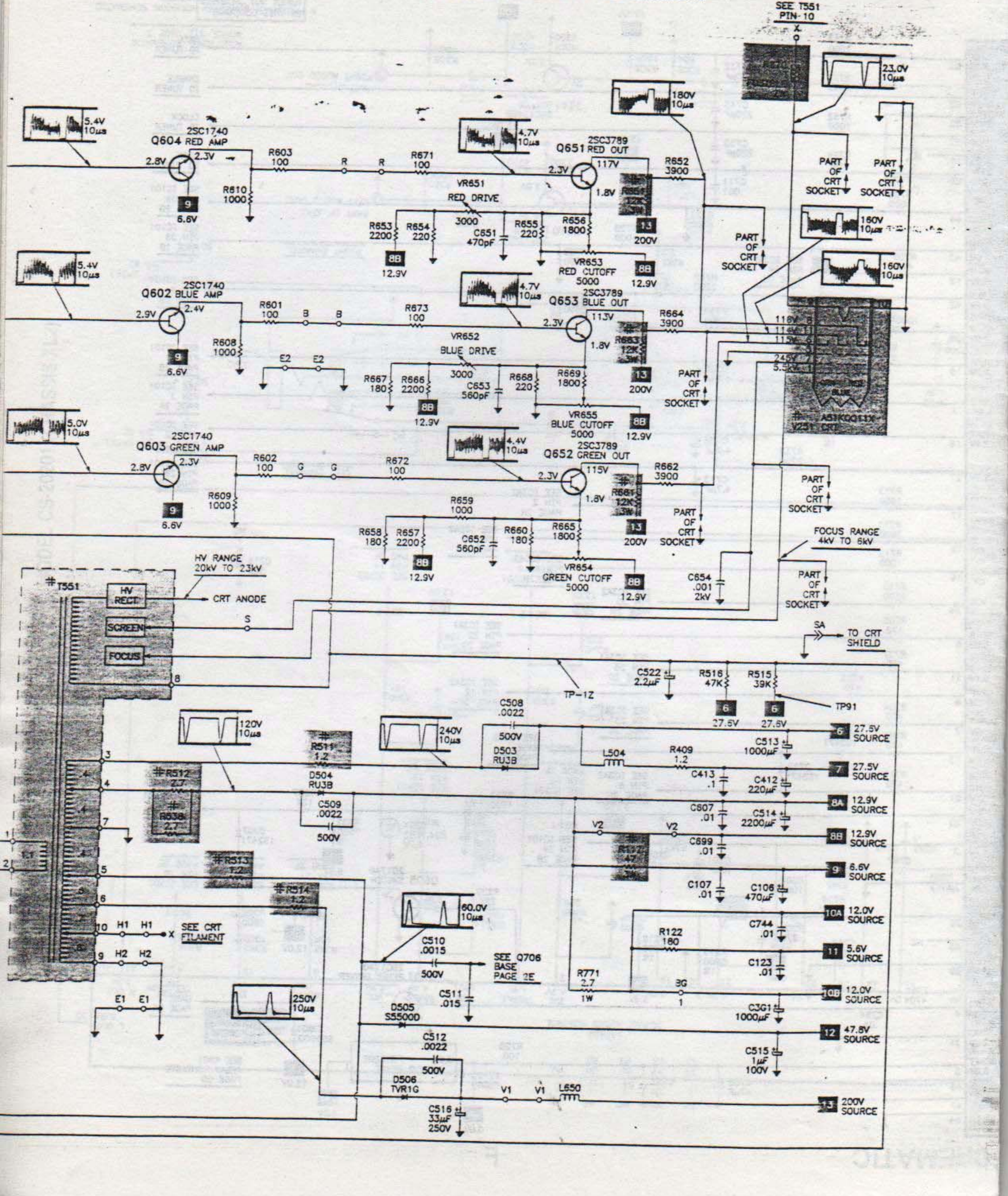
B

# SCHEMATIC

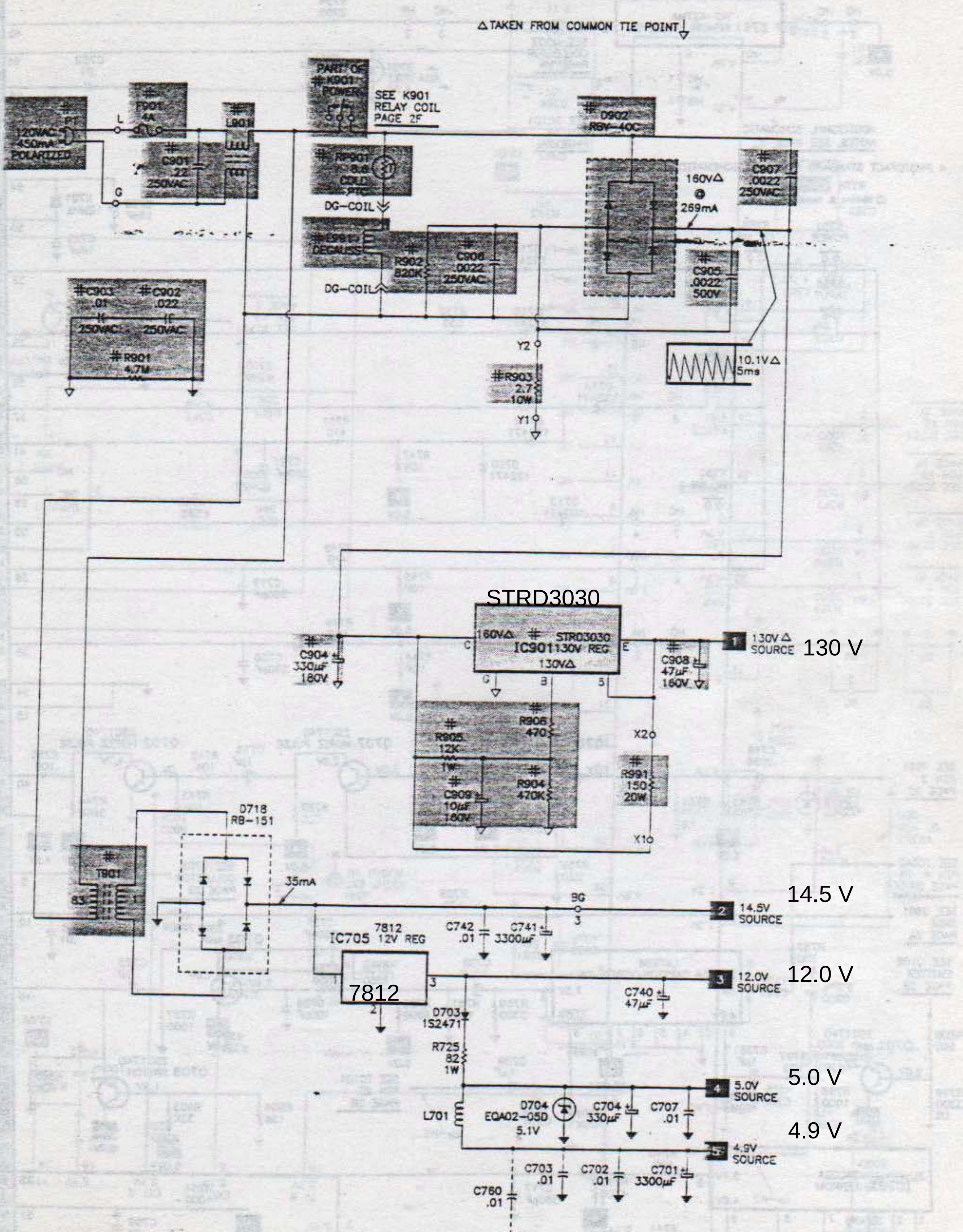


SEE *IC3A1 PIN 1 PAGE 2G
SEE IC701 PIN 18 PAGE 2F
TAKEN WITH BAR SWEEP GENERATOR
1.4V 10µs
SEE Q701 BASE PAGE 2E
1.2V 10µs
SEE IC701 PIN 42 PAGE 2F
SEE IC701 PIN 27 PAGE 2F
SEE IC701 PIN 19 PAGE 2F
R201 10K
R202 33K 1%
R203 30K 1%
VR602 SUB TINT 30K
2SA933S
Q102 VIF AMP2
R115 1500
R126 100
1.9V
2.5V
C112 .22
R113 4700
R114 1000
VO 3.3V
AGC ADJ 1.9V
VIN1 3.5V
VIN2 2.6V
0V BOSD
PART OF XRA7306S
IC101 VSIF/VCJ
1.8V SHARP
2.7V COLOR
3.2V TINT
2.8V R
B 2.9V
G 2.8V
ROSD 0V
GOSD 0V
1R 2.4V
CONTRAST 3.5V
X3.58 1.9V
BRT 3.1V
BRT 4.0V
VCC2 2.4V
6.6V
VR101 RF AGC 200K
C113 .01
1.2V 10µs
1.4V 10µs
TAKEN WITH BAR SWEEP GENERATOR
J201 EXT VIDEO IN
R776 100
R217 75
C205 .22
SEE IC701 PIN 44 PAGE 2F
R116 24K 1%
C601 .001
X601 3.58MHz
C207 .01
C117 .22
C115 .1 (.22)
SEE IC701 PIN 43 PAGE 2F
SEE IC701 PIN 3 PAGE 2F
SEE IC701 PIN 26 PAGE 2F
SEE IC704 PIN 6 PAGE 2E
R210 220
R214 82K
C108 470µF
R108 6.8
D203 1S2471
R209 4700
VR201 SUB CONT 100K
R211 22K
R213 1000
D202 1S2471
R212 3300
D201 1S2471
SEE IC701 PIN 28 PAGE 2E
3.0V 5ms
2.4V 5ms
L491 YOKE
DY-H
RED
DY-V
BROWN
YEL
3.3
10.5
DY-H BLUE
IC401 LA7837 VERT OUT
3.9V
2.4V
27.4V
12.2V
6.1V
6.2V
6.0V
1.4V
15.8V
5.9V
NC
C406 100µF
D402 S5500D
27.5V
C404 .01
R402 68K
R403 18K
R417 100K
C405 1µF
R404 12K
R408 2.2
C408 .0047 500V
C409 .1
54V 5ms
R510 270 3W
R531 150 3W
L502
MAGNET
C507 .27 200V
130V△
D401 RD12FB2 12.0V
R401 27
12.9V
VR401 VERT HEIGHT 50K
R405 33K
VR402 VERT LIN 50K
C410 1µF
R406 47K
C411 2200µF
R407 3.3 1W
R416 1800
2SC1740 HORIZ PREDRIVE
2.3V
26.7V
R536 1000
R504 10K
.8V 10µs
2SC2655
Q501 HORIZ DRIVER
.5V
6.7V
C503 .047
R505 100
19.0V 10µs
T552
3.7
.3
12.0V△ 10µs
C504 1µF
R506 270 3W
2SD1878
Q503 HORIZ OUT
-.1V△
129V△
0V△
C505 220pF 2kV
C521 220pF 2kV
C506 .0082 1.6kV
Z901 2A
R509 3.3 5W
L501
130V△
2SC1740 SYNC
.2V
R702 100
SEE IC701 PIN 5 PAGE 2E
R774 1000
C714 1µF
5.0V
D502 S5500D
27.6V
△ TAKEN FROM COMMON TIE POINT

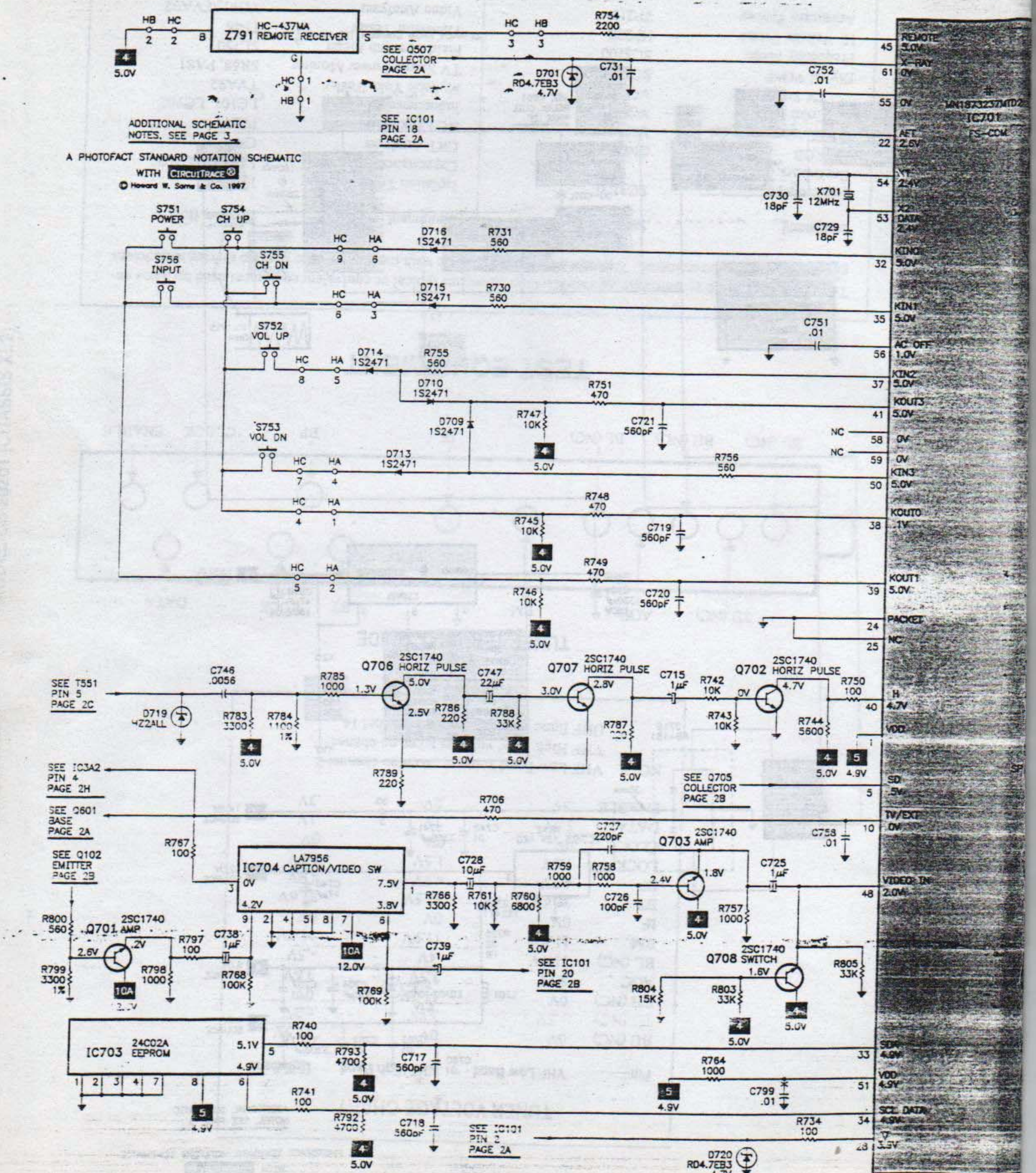
# C
# TELEVISION SCHEMATIC continued



# D
# POWER SUPPLY SCHEMATIC

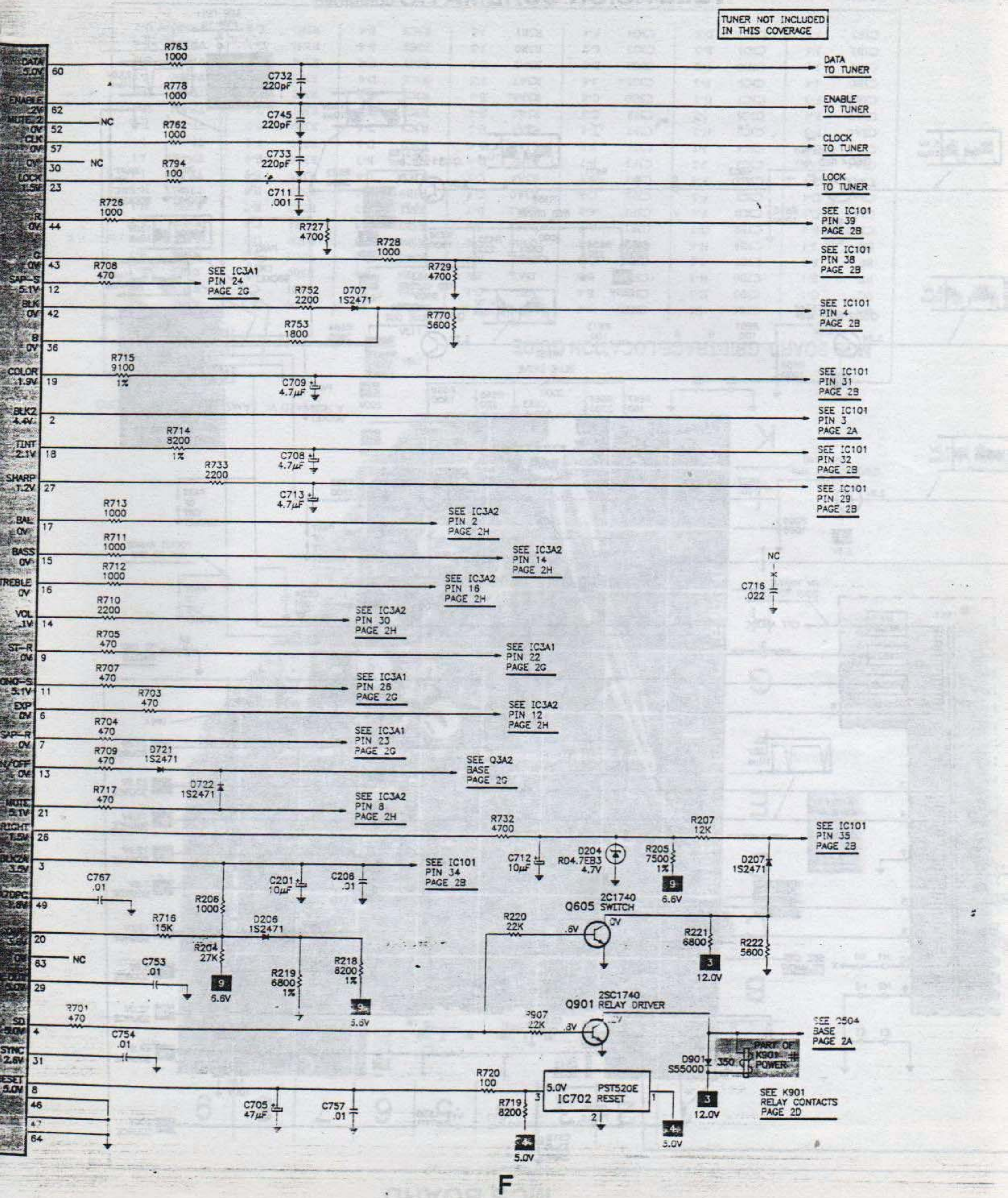



ADDITIONAL SCHEMATIC NOTES. SEE PAGE 3


HB HC
2 2
5.0V
Z791 HC-437MA REMOTE RECEIVER
SEE Q507 COLLECTOR PAGE 2A
D701 RD4.7EB3 4.7V
R754 2200
C731 .01
C752 .01
SEE IC101 PIN 18 PAGE 2A
ADDITIONAL SCHEMATIC NOTES, SEE PAGE 3
A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE
© Howard W. Sams & Co. 1997
S751 POWER
S754 CH UP
S756 INPUT
S755 CH DN
S752 VOL UP
S753 VOL DN
D716 1S2471
R731 560
D715 1S2471
R730 560
D714 1S2471
R755 560
D710 1S2471
D709 1S2471
D713 1S2471
R751 470
R747 10K
C721 560pF
R756 560
R748 470
R745 10K
C719 560pF
R749 470
R746 10K
C720 560pF
C751 .01
X701 12MHz
C730 18pF
C729 18pF
MN18723237MD2 IC701 FS-COM
REMOTE 5.0V
X-RAY 0V
0V
AFT 2.6V
X1 2.4V
X2 DATA 2.4V
KIN0 5.0V
KIN1 5.0V
AC OFF 1.0V
KIN2 5.0V
KOUT3 5.0V
NC
KIN3 5.0V
KOUT0 .1V
KOUT1 5.0V
PACKET
H 4.7V
VDD
SD .5V
TV/EXT 0V
VIDEO IN 2.0V
SDA 4.9V
VDD 4.9V
SCL DATA 4.9V
3.5V
SEE T551 PIN 5 PAGE 2C
C746 .0056
D719 HZ2ALL
R783 3300
R784 1100 1%
R785 1000
Q706 2SC1740 HORIZ PULSE
C747 22µF
R786 220
R788 33K
R789 220
Q707 2SC1740 HORIZ PULSE
R787 120
C715 1µF
R742 10K
R743 10K
Q702 2SC1740 HORIZ PULSE
R750 100
R744 5600
SEE IC3A2 PIN 4 PAGE 2H
SEE Q601 BASE PAGE 2A
R706 470
SEE Q705 COLLECTOR PAGE 2B
C758 .01
R767 100
SEE Q102 EMITTER PAGE 2B
IC704 LA7956 CAPTION/VIDEO SW
C728 10µF
R766 3300
R761 10K
R760 6800
R759 1000
R758 1000
C727 220pF
C726 100pF
Q703 2SC1740 AMP
C725 1µF
R757 1000
R800 560
Q701 2SC1740 AMP
R799 3300 1%
R797 100
C738 1µF
R798 1000
R768 100K
C739 1µF
R769 100K
SEE IC101 PIN 20 PAGE 2B
Q708 2SC1740 SWITCH
R805 33K
R804 15K
R803 33K
IC703 24C02A EEPROM
R740 100
R793 4700
C717 560pF
R741 100
R792 4700
C718 560pF
SEE IC101 PIN 2 PAGE 2A
R764 1000
C799 .01
R734 100
D720 RD4.7EB3 4.7V

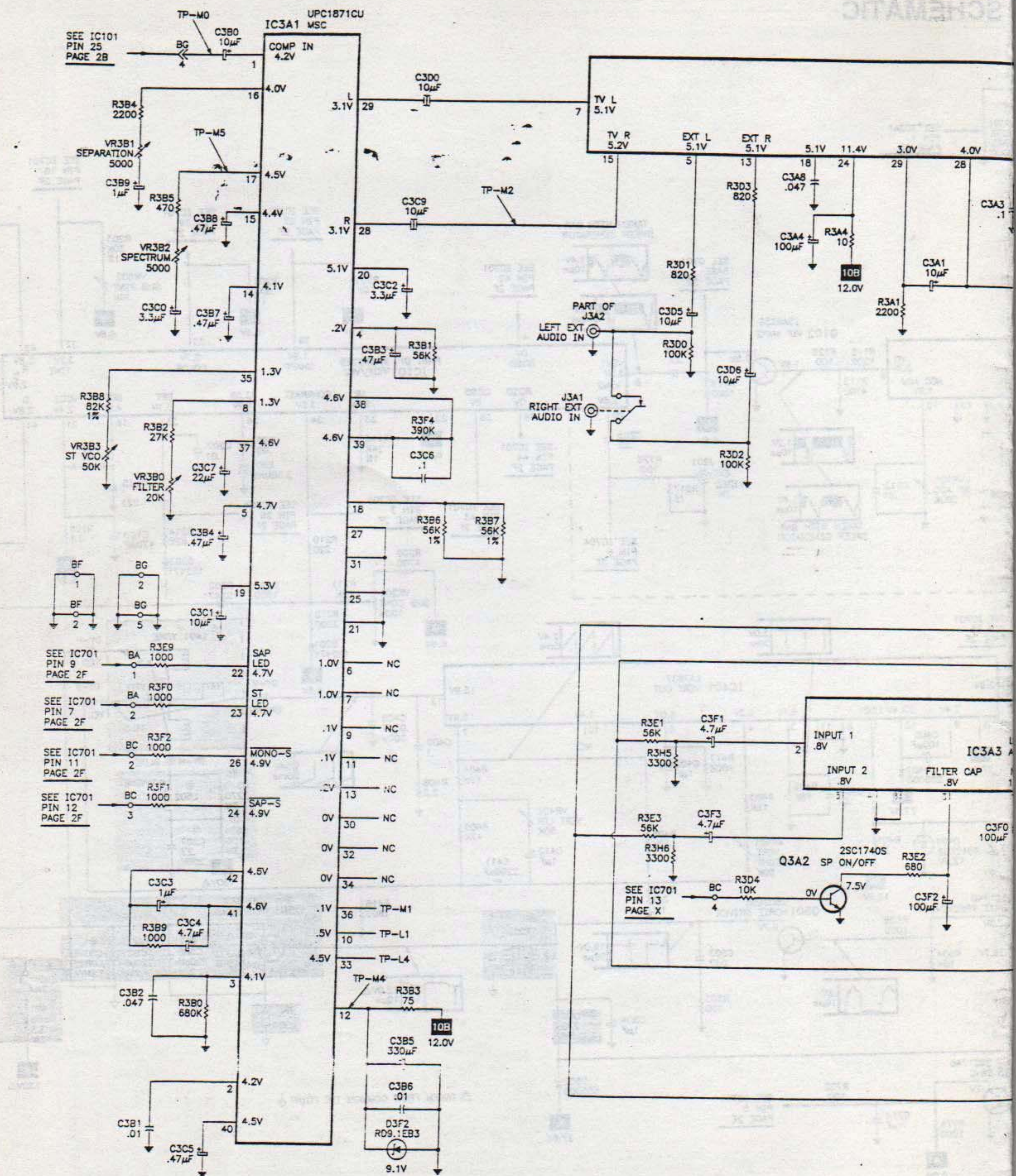
ROL SCHEMATIC

SISTEMA DE CONTROL 2

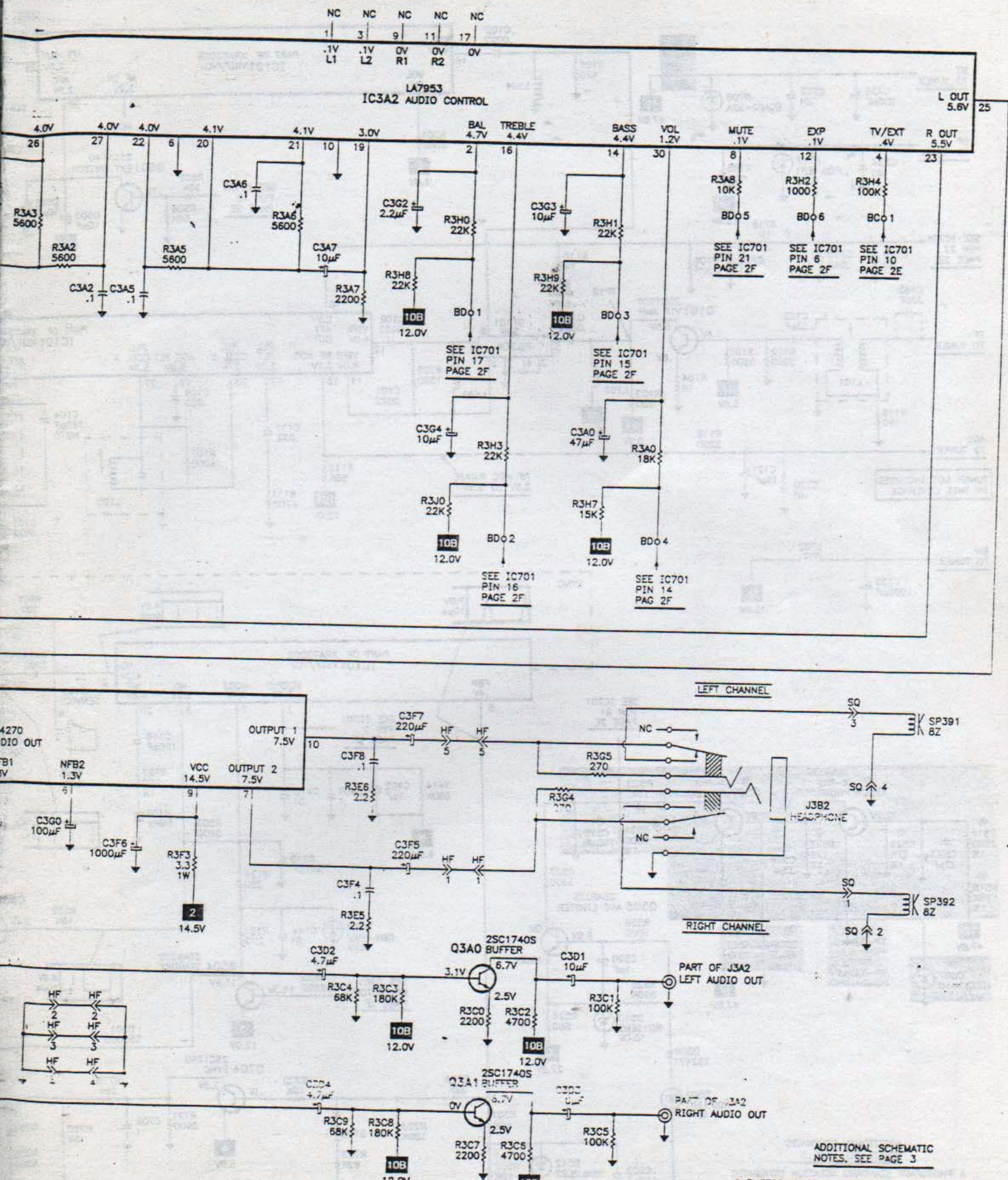



F

# AUDIO S


IC3A1 UPC1871CU MSC
TP-M0
SEE IC101 PIN 25 PAGE 2B
BG 4
C3B0 10µF
COMP IN 4.2V
C3D0 10µF
L 3.1V 29
TV L 5.1V
TV R 5.2V
EXT L 5.1V
EXT R 5.1V
R3B4 2200
VR3B1 SEPARATION 5000
TP-M5
C3B9 1µF
R3B5 470
C3B8 .47µF
C3C9 10µF
TP-M2
R 3.1V 28
VR3B2 SPECTRUM 5000
C3C0 3.3µF
C3B7 .47µF
C3C2 3.3µF
C3B3 .47µF
R3B1 56K
R3B8 82K 1%
VR3B3 ST VCO 50K
R3B2 27K
R3F4 390K
C3C6 .1
C3C7 22µF
VR3B0 FILTER 20K
C3B4 .47µF
R3B6 56K 1%
R3B7 56K 1%
BF 1
BG 2
BF 2
BG 5
C3C1 10µF
SEE IC701 PIN 9 PAGE 2F
BA 1
R3E9 1000
SAP LED 4.7V
SEE IC701 PIN 7 PAGE 2F
BA 2
R3F0 1000
ST LED 4.7V
SEE IC701 PIN 11 PAGE 2F
BC 2
R3F2 1000
MONO-S 4.9V
SEE IC701 PIN 12 PAGE 2F
BC 3
R3F1 1000
SAP-S 4.9V
NC
C3C3 1µF
R3B9 1000
C3C4 4.7µF
TP-M1
TP-L1
TP-L4
TP-M4
C3B2 .047
R3B0 680K
R3B3 75
10B 12.0V
C3B5 330µF
C3B6 .01
D3F2 RD9.1EB3
9.1V
C3B1 .01
C3C5 .47µF
C3A8 .047
C3A4 100µF
R3A4 10
R3D3 820
R3D1 820
C3D5 10µF
PART OF J3A2
LEFT EXT AUDIO IN
R3D0 100K
C3D6 10µF
J3A1
RIGHT EXT AUDIO IN
R3D2 100K
C3A3 .1
C3A1 10µF
R3A1 2200
R3E1 56K
C3F1 4.7µF
R3H5 3300
INPUT 1 .8V
INPUT 2 .8V
IC3A3
FILTER CAP .8V
R3E3 56K
C3F3 4.7µF
R3H6 3300
Q3A2 2SC1740S SP ON/OFF
SEE IC701 PIN 13 PAGE X
BC 4
R3D4 10K
0V
7.5V
R3E2 680
C3F2 100µF
C3F0 100µF

AUDIO 2




ADDITIONAL SCHEMATIC NOTES, SEE PAGE 3

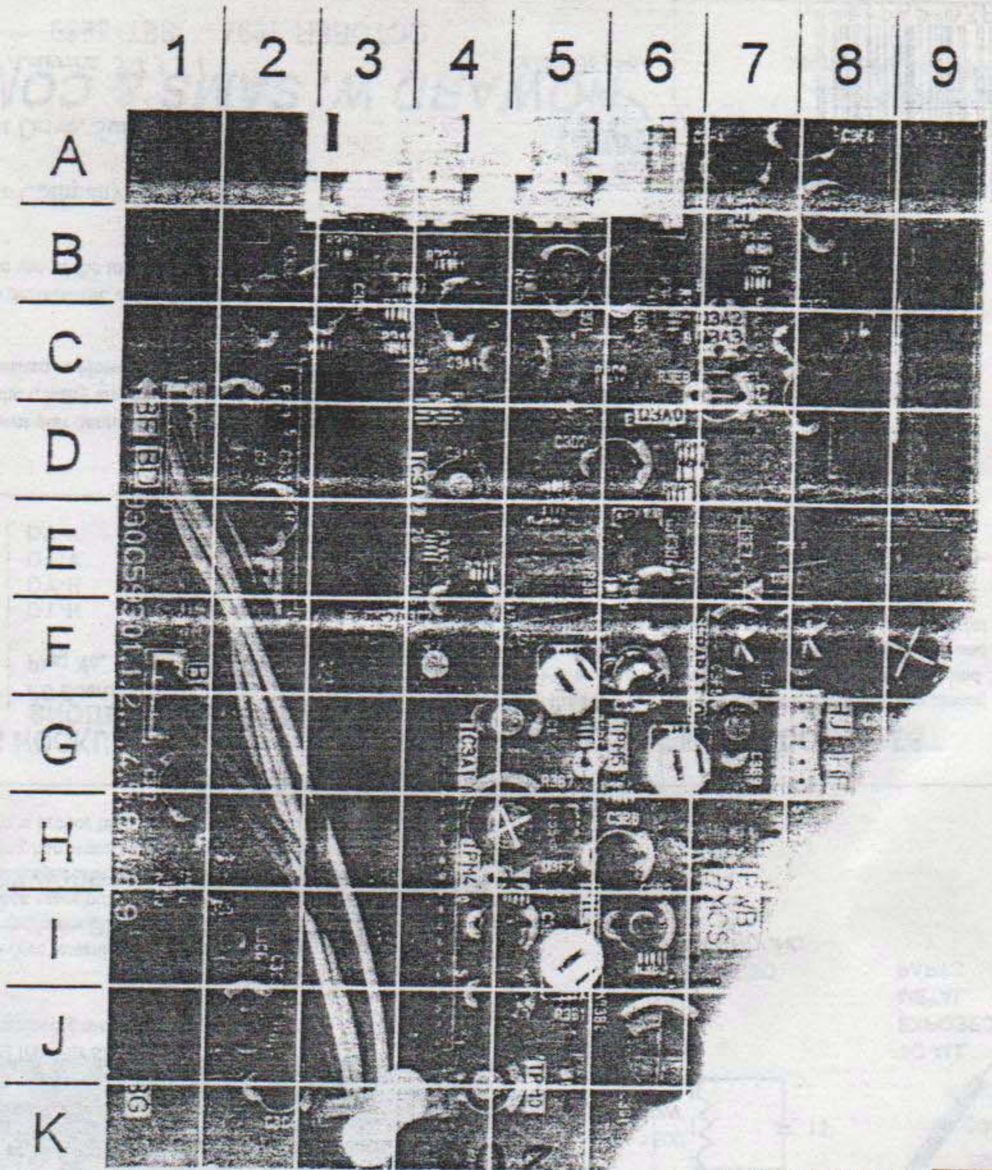
A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE®



MITSUBISHI

MODEL CS-20201 (CHASSIS XL2)

# MCS BOARD




A HOWARD W. SAMS GRIDTRACE™ PHOTO

## MCS BOARD, GRIDTRACE LOCATION GUIDE

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BA | E-2 | C3B4 | I-5 | C3D3 | B-6 | D3F2 | H-5 | R3B2 | I-5 | R3D0 | B-3 | R3H2 | F-1 |
| BC | G-1 | C3B5 | H-5 | C3D4 | E-6 | HF | G-8 | R3B3 | I-6 | R3D1 | C-3 | R3H3 | F-1 |
| BD | B-1 | C3B6 | H-5 | C3D5 | B-3 | J3A1 | A-1 | R3B4 | H-6 | R3D2 | A-2 | R3H5 | A-7 |
| BF | B-1 | C3B7 | I-6 | C3D6 | B-2 | J3A2 | A-4 | R3B5 | G-5 | R3D3 | C-2 | R3H6 | B-7 |
| BG | J-1 | C3B8 | H-6 | C3F0 | A-8 | Q3A0 | C-6 | R3B6 | G-5 | R3D4 | D-5 | R3H7 | C-3 |
| C3A0 | B-4 | C3B9 | G-7 | C3F1 | A-7 | Q3A1 | E-6 | R3B7 | G-5 | R3E1 | C-6 | R3H8 | B-3 |
| C3A1 | C-5 | C3C0 | F-6 | C3F2 | A-8 | Q3A2 | B-7 | R3B8 | H-2 | R3E2 | B-7 | R3H9 | H-1 |
| C3A2 | C-4 | C3C1 | F-5 | C3F3 | C-8 | R3A0 | C-3 | R3B9 | J-2 | R3E3 | B-6 | R3J0 | H-1 |
| C3A3 | D-4 | C3C2 | F-4 | C3F4 | D-8 | R3A1 | C-5 | R3C0 | C-6 | R3E5 | E-9 | TP-L1 | I-4 |
| C3A4 | D-4 | C3C3 | J-2 | C3F5 | F-7 | R3A2 | D-4 | R3C1 | B-7 | R3E6 | E-9 | TP-M0 | J-1 |
| C3A5 | E-4 | C3C4 | J-2 | C3F6 | F-9 | R3A3 | D-4 | R3C2 | D-6 | R3E9 | F-2 | TP-M1 | I-1 |
| C3A6 | F-5 | C3C5 | H-2 | C3F7 | F-8 | R3A4 | E-5 | R3C3 | D-6 | R3F0 | F-2 | TP-M2 | F-2 |
| C3A7 | F-4 | C3C6 | I-2 | C3F8 | E-8 | R3A5 | E-4 | R3C4 | D-5 | R3F1 | G-2 | TP-M4 | H-4 |
| C3A8 | F-3 | C3C7 | G-1 | C3G0 | C-8 | R3A6 | E-4 | R3C5 | B-5 | R3F2 | G-2 | TP-M5 | G-4 |
| C3B0 | J-4 | C3C9 | F-3 | C3G1 | J-6 | R3A7 | F-5 | R3C6 | D-6 | R3F3 | H-7 | VR3B0 | I-5 |
| C3B1 | J-6 | C3D0 | F-2 | C3G2 | D-2 | R3A8 | D-2 | R3C7 | E-6 | R3F4 | I-2 | VR3B1 | G-6 |
| C3B2 | J-5 | C3D1 | B-5 | C3G3 | E-2 | R3B0 | J-5 | R3C8 | E-6 | R3H0 | D-1 | VR3B2 | F-5 |
| C3B3 | J-5 | C3D2 | D-6 | C3G4 | F-4 | R3B1 | J-5 | R3C9 | E-6 | R3H1 | E-1 | VR3B3 | G-2 |

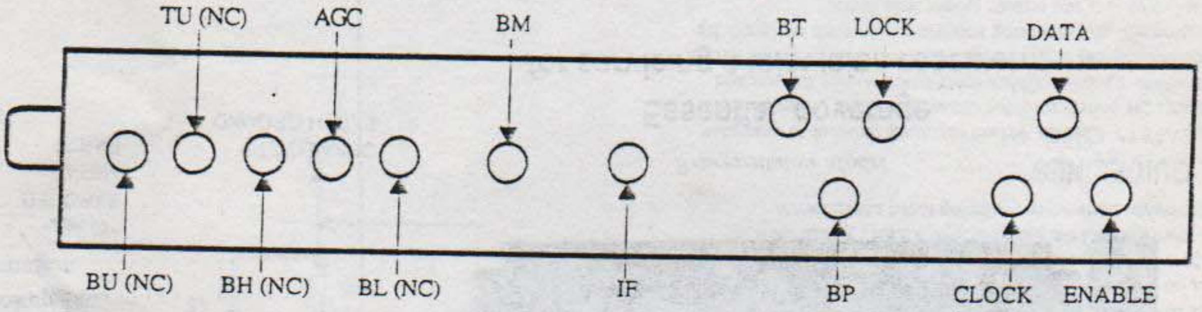
# TUNER INFORMATION

## TUNER VOLTAGE CHART

| Pin | VHF Low Band | VHF High Band | UHF Band |
|---|---|---|---|
| BU (NC) | 0V | 0V | 11.5V |
| TU (NC) | [illegible].5V | 3.9V | [illegible].2V |
| BH (NC) | 0V | 11.7V | 0V |
| AGC | 3.1V | 3.5V | 3.6V |
| BL (NC) | 11.4V | .4V | -.5V |
| BM | 11.8V | 11.9V | 11.8V |
| IF | 0V | 0V | 0V |
| BT | 32.4V | 32.5V | 32.6V |
| BP | 4.9V | 4.9V | 4.9V |
| LOCK | 1.5V | 1.5V | 1.5V |
| CLOCK | 0V | 0V | 0V |
| DATA | 5.0V | .1V | .1V |
| ENABLE | .3V | .2V | .3V |

NOTE: VHF Low Band voltages taken on channel 2.
VHF High Band voltages taken on channel 7.
UHF Band voltages taken on channel 14.

## TUNER TERMINAL GUIDE




# TEST EQUIPMENT

Test equipment listed by participating manufacturer illustrates typical or equivalent equipment used by Sams engineers to obtain measurements. This equipment is compatible with most types used by field service technicians.

| Equipment | Sencore No. | Equipment | Sencore No. |
|---|---|---|---|
| Oscilloscope | SC3100 | Isolation Transformer | PR57 |
| Generators | | Capacitance Analyzer | LC101, LC102 |
| RGB | CM2000 | CRT Analyzer | CR70 |
| Multiburst Signal | VG91 | AC Leakage Tester | PR57 |
| Color Bar | VG91 | Inductance Analyzer | LC101, LC102 |
| TV Stereo | VG91 | Flyback Yoke Tester | TVA92 |
| Digital VOM | SC3100 | TV Stereo Power Monitor | SR68, PA81 |
| Frequency Meter | SC3100 | Field Strength Meter | SL750 |
| Hi-Voltage Probe | HP200 | Transistor Tester | TF46 |
| Accessory Probes | TP212 | Video Analyzer | VG91, TVA92 |

# PARTS LIST

## SEMICONDUCTORS

(Select the replacement that gives the best results.)

| Item No. | Type No. | Mfr. Part No. | NTE Part No. | ECG Part No. | TCE Part No. |
|---|---|---|---|---|---|
| D3F2 | RD9.1EB3 | 264P463080 | NTE5018A | ECG5018A | SK9A1 |
| D101 | RD9.1FB2 | 264P486050 | NTE139A | ECG139A | SK9V1 |
| | RD9.1EB2 | - | NTE5018A | ECG5018A | SK9A1 |
| | EQA02-09B | - | NTE5018A | ECG5018A | SK9A1 |
| D201, 02, 03 | 1S2471 | 264P045040 | NTE519 | ECG519 | SK3100 |
| | 1S2076A | - | NTE519 | ECG519 | SK3100 |
| D204 | EQA02-05B | - | NTE5009A | ECG5009A | SK4A7 |
| | RD4.7EB3 | 264P460050 | NTE5009A | ECG5009A | SK4A7 |
| D206, 07 | 1S2471 | 264P045040 | NTE519 | ECG519 | SK3100 |
| | 1S2076A | - | NTE519 | ECG519 | SK3100 |
| D401 | RD12FB2 | 264P487080 | NTE142A | ECG142A | SK12V |
| | EQA02-11C | | NTE5021A | ECG2021A | SK12A |
| D402 | S5500D | 264P285010 | NTE116 | ECG116 | SK3313 |
| D501, 02 | S5500D | 264P285010 | NTE116 | ECG116 | SK3313 |
| D503, 04 | RU3B | 264P102020 | NTE552 | ECG552 | SK3318A |
| D505 | S5500D | 264P285010 | NTE116 | ECG116 | SK3313 |
| D506 | TVR1G | - | NTE552 | ECG552 | SK9000 |
| | ES1C | 264P295020 | NTE552 | ECG552 | SK9000 |
| # D507 | HZT33-01 | 264P244022 | NTE615 | ECG615A | SK9976 |
| D508 | 1S2471 | 264P045040 | NTE519 | ECG519 | SK3100 |
| | 1S2076A | - | NTE519 | ECG519 | SK3100 |
| D509 | EQA02-09A | - | NTE5018A | ECG5018A | SK9A1 |
| | RD9.1EB1 | 264P463060 | NTE5018A | ECG5018A | SK9A1 |
| D512 | EQA02-08C | - | NTE5016A | ECG5016A | SK8A2 |
| | RD8.2EB2 | 264P463020 | NTE5016A | ECG5016A | SK8A2 |
| D513 | EQA02-10A | - | NTE5019A | ECG5019A | SK10A |
| | RD10EB2 | 264P464030 | NTE5019A | ECG5019A | SK10A |
| D701 | EQA02-05B | - | NTE5009A | ECG5009A | SK4A7 |
| | RD4.7EB3 | 264P460050 | NTE5009A | ECG5009A | SK4A7 |
| D703 | 1S2471 | 264P045040 | NTE519 | ECG519 | SK3100 |
| | 1S2076A | - | NTE519 | ECG519 | SK3100 |
| D704 | EQA02-05D | - | NTE5010A | ECG5010A | SK5A1 |
| | RD5.1EB2 | - | NTE5010A | ECG5010A | SK5A1 |
| | RD5.1FB2 | 264P483080 | NTE5010A | ECG5010A | SK5A1 |
| D707 | 1S2471 | 264P045040 | NTE519 | ECG519 | SK3100 |
| | 1S2076A | - | NTE519 | ECG519 | SK3100 |
| D708 | EQA02-32A | - | - | - | - |
| | RD33EB2 | 264P470060 | NTE5036A | ECG5036A | SK33A |
| D709, 10 | 1S2471 | 264P045040 | NTE519 | ECG519 | SK3100 |
| | 1S2076A | - | NTE519 | ECG519 | SK3100 |
| D713 Thru D716 | 1S2471 | 264P045040 | NTE519 | ECG519 | SK3100 |
| | 1S2076A | - | NTE519 | ECG519 | SK3100 |
| D717 | EQA02-05C | - | NTE5010A | ECG5010A | SK5A1 |
| | RD5.1EB1 | 264P460060 | NTE5010A | ECG5010A | SK5A1 |
| D718 | RB-151 | 264P544010 | NTE5304 | ECG5304 | SK3106 |
| D719 | HZ2ALL | 264P501010 | - | - | SK2A8 |
| D720 | EQA02-05A | - | NTE5009A | ECG5009A | SK4A7 |
| | EQA02-05B | - | NTE5009A | ECG5009A | SK4A7 |
| | RD4.7EB3 | 264P460050 | NTE5009A | ECG5009A | SK4A7 |
| D721, 22 | 1S2471 | 264P045040 | NTE519 | ECG519 | SK3100 |
| | 1S2076A | - | NTE519 | ECG519 | SK3100 |
| D798 | - | - | - | - | - |
| D799 | - | - | - | - | - |
| D901 | S5500D | 264P285010 | NTE116 | ECG116 | SK3313 |
| # D902 | RBV-40C | 264P512020 | NTE5311 | ECG5311 | SK5031 |
| | RBV-40B | - | NTE5311 | ECG5311 | SK5031 |
| IC3A1 | UPC1871CU | 272P351020 | - | - | - |
| IC3A2 | LA7953 | 272P139010 | - | - | - |
| IC3A3 | LA4270 | 272P140010 | NTE1798 | ECG1798 | SK9745 |

**# For SAFETY use only equivalent replacement part.**

## SEMICONDUCTORS continued

(Select the replacement that gives the best results.)

| Item No. | Type No. | Mfr. Part No. | NTE Part No. | ECG Part No. | TCE Part No. |
|---|---|---|---|---|---|
| IC101 | XRA7306S | 272P837030 | - | - | - |
| IC401 | LA7837 | 272P239030 | NTE7104 | ECG7104 | - |
| # IC701 | MN1873237MTD2 | 274P344020 | - | - | - |
| IC702 | PST520E | 266P130030 | - | - | - |
| IC703 | 24C02A | - | - | - | - |
| | CAT24C02P | 263D002010 | - | - | - |
| IC704 | LA7956 | 272P394010 | - | - | - |
| IC705 | 7812 | - | NTE966 | ECG966 | SK3592 |
| | UPC7812H | 266P934020 | NTE966 | ECG966 | SK3592 |
| # IC901 | STRD3030 | 267P925010 | - | ECG1777 | - |
| Q3A0, A1, A2 | 2SC1740S-R | - | NTE85 | ECG85 | SK3122 |
| | 2SC1740S-S | 260P559030 | NTE85 | ECG85 | SK3122 |
| | 2SC2603-E | - | NTE289A | ECG289A | SK9137 |
| | 2SC2603-F | - | NTE289A | ECG289A | SK9137 |
| Q101 | 2SC1906 | 260P356010 | NTE107 | ECG107 | SK3293 |
| Q102 | 2SA933S-S | 260P560040 | NTE290A | ECG290A | SK9132 |
| | 2SA933S-R | - | NTE290A | ECG290A | SK9132 |
| | 2SA1115-E | 260P256030 | NTE290A | ECG290A | SK9138 |
| | 2SA1115-F | - | NTE290A | ECG290A | SK9138 |
| Q501 | 2SC2655-Y | 260P325030 | NTE293 | ECG293 | SK3849 |
| # Q503 | 2SD1878 | 260P607010 | NTE2331 | ECG2331 | SK10088 |
| Q504, 05 | 2SA933S-S | 260P560040 | NTE290A | ECG290A | SK9132 |
| | 2SA933S-R | - | NTE290A | ECG290A | SK9132 |
| | 2SA1115-E | 260P256030 | NTE290A | ECG290A | SK9138 |
| | 2SA1115-F | - | NTE290A | ECG290A | SK9138 |
| # Q506, 07 | 2SA933S-S | 260P560040 | NTE290A | ECG290A | SK9132 |
| | 2SA933S-R | - | NTE290A | ECG290A | SK9132 |
| | 2SA1115-E | 260P256030 | NTE290A | ECG290A | SK9138 |
| | 2SA1115-F | - | NTE290A | ECG290A | SK9138 |
| Q508 | 2SC1740S-E | 260P559050 | NTE85 | ECG85 | SK3122 |
| | 2SC1740S-R | - | NTE85 | ECG85 | SK3122 |
| | 2SC1740S-S | 260P559030 | NTE85 | ECG85 | SK3122 |
| | 2SC2603-E | - | NTE289A | ECG289A | SK9137 |
| | 2SC2603-F | - | NTE289A | ECG289A | SK9137 |
| | 2SC2603-G | - | NTE289A | ECG289A | SK9137 |
| Q601 Thru Q604 | 2SC1740S-E | 260P559050 | NTE85 | ECG85 | SK3122 |
| | 2SC1740S-R | - | NTE85 | ECG85 | SK3122 |
| | 2SC1740S-S | 260P559030 | NTE85 | ECG85 | SK3122 |
| | 2SC2603-E | - | NTE289A | ECG289A | SK9137 |
| | 2SC2603-F | - | NTE289A | ECG289A | SK9137 |
| Q605 | 2SC1740S-E | 260P599050 | NTE85 | ECG85 | SK3122 |
| | 2SC1740S-R | - | NTE85 | ECG85 | SK3122 |
| | 2SC1740S-S | 260P559030 | NTE85 | ECG85 | SK3122 |
| | 2SC2603-E | - | NTE289A | ECG289A | SK9137 |
| | 2SC2603-F | - | NTE289A | ECG289A | SK9137 |
| | 2SC2603-G | - | NTE289A | ECG289A | SK9137 |
| Q651, 52, 53 | 2SC3789-D | 260P571010 | NTE157 | ECG157 | SK3747 |
| | 2SC3789-E | - | NTE157 | ECG157 | SK3747 |
| Q701 Thru Q708 | 2SC1740S-E | 260P559050 | NTE85 | ECG85 | SK3122 |
| | 2SC1740S-S | 260P559030 | NTE85 | ECG85 | SK3122 |
| | 2SC1740S-R | - | NTE85 | ECG85 | SK3122 |
| | 2SC2603-E | - | NTE289A | ECG289A | SK9137 |
| | 2SC2603-F | - | NTE289A | ECG289A | SK9137 |
| Q901 | 2SC1740S-S | 260P559030 | NTE85 | ECG85 | SK3122 |
| | 2SC1740S-R | - | NTE85 | ECG85 | SK3122 |
| | 2SC1740S-E | 260P559050 | NTE85 | ECG85 | SK3122 |
| | 2SC2603-E | - | NTE289A | ECG289A | SK9137 |
| | 2SC2603-F | - | NTE289A | ECG289A | SK9137 |

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